

# **Southern California Edison's (SCE) WDAT Queue Cluster 14**

An Introduction to SCE's Cluster Study Process

# Purpose of Presentation

- This self-guided presentation is to help provide an understanding of SCE's Cluster Study Process under the Wholesale Distribution Access Tariff (WDAT) Generator Interconnection Procedures (GIP), specifically how to properly submit an Interconnection Request.
- Should there be discrepancies between this presentation and SCE's tariffs, SCE's tariffs and interconnection documents prevail.

# Overview

- **QC 14 Updates**
- **Agreement Types**
- **Interconnection Request Information**
  - IR Checklist
  - Submittal of Interconnection Requests and Deposits
  - Interconnection Request Forms
  - Required Technical Documents
- **Smart Inverter Requirements**
- **Demonstrating Site Exclusivity**
- **Sizing Your Generating Facility**
  - Distribution Circuits
  - Grid Voltages
- **Deliverability**
- **Charging Distribution Service for Storage projects**
  - WDAT Amendment Energy Storage
- **Wrap-Up**
  - Quick Tips
  - Important Dates & Links
  - Questions - Via Email
- **Appendix**
  - Acronym List
  - Sample Application

# What's new for QC14?

Here are some of the changes and updates for QC14:

- WDAT tariff changes were made effective October 30, 2019<sup>1</sup>
  - Added and modified definitions
  - New and modified sections for Charging Distribution Service for storage projects
  - SCE recommends that you review the WDAT tariff for additional changes, including Attachment K, which describes rates for Charging Distribution Service. These rates were recently reduced per FERC Docket No. ER19-2505-003.
- Revised Cluster Study Agreement (Appendix 3 to GIP) and Interconnection Request ("IR") form (Appendix 1 to GIP). The revised IR Form now includes:
  - For energy storage projects, Interconnection Customer must choose the type of Charging Distribution Service: 1) As-Available Charging Distribution Service only; or, 2) Firm Charging Distribution Service only; or, 3) a combination of As-Available and Firm; or, 4) None (charging from onsite generation)
  - Distribution service information (Section 10). A separate Distribution Service request or a deposit is no longer required
  - New Section 11 in Attachment A, "Storage System Information." The "additional technical data form," or BESS Form, is no longer required
- Additional Study Deposit is required for storage projects requesting Firm Charging Distribution Service (\$20,000)
- Cluster study timelines will add forty-five (45) calendar days for storage projects requesting Firm Charging Distribution Service or a combination of As-Available Charging Distribution Service and Firm Charging Distribution Service.

<sup>1</sup>SCE submitted changes to its WDAT in FERC Docket No. ER19-2505., FERC accepted the changes on January 24, 2020, effective October 30, 2019, but subject to refund and settlement. Following the conclusion of settlement procedures and a final order from FERC, additional changes to the WDAT may be required, which could impact your proposed project. FERC accepted additional changes on March 16, 2021, in FERC Docket No. ER19-2505-003.

# Agreement Types

<p>Wholesale Distribution Access Tariff (WDAT) Interconnection Agreement (IA)</p>	<p>Allows Developers to interconnect their project to SCE's distribution system</p>
<p>Wholesale Distribution Service Agreement (DSA)</p>	<p>Allows Developers to transmit electrons through SCE's distribution system</p>
<p>Power Procurement Agreement (PPA)*</p>	<ul style="list-style-type: none"><li>- Selling your power to a buyer (SCE, PG&amp;E, SDG&amp;E, etc.)</li><li>- Not included as part of this presentation</li></ul>

# WDAT Interconnection Request Checklist

- ☑ Completed Interconnection Request (Appendix 1 to GIP), with all requested technical data
  - ☑ Single-Line Electrical Diagram
  - ☑ Site/Plot Plan Diagram
  - ☑ Proof of Site Exclusivity, or In-Lieu Deposit (\$100,000  $\leq$  20 MW or \$250,000  $>$  20 MW)
  - ☑ Diagrams, manufacturer's data, and written descriptions of the generating facilities
  - ☑ Distribution Service information (Interconnection Request Section 10)
  - ☑ Storage System information required for storage systems (Interconnection Request Section 11 in Attachment A)
- ☑ Study Deposit: \$50,000 plus \$1,000/MW, up to \$250,000 maximum, and \$20,000 for projects that include a request for Firm Charging Distribution Service. Projects with a combination of Firm Charging Distribution Service and As-Available Charging Distribution service require an additional \$20,000.
  - Submit your Study Deposits separately by following the payment instructions

Reminder: There is a new IR form for QC 14

**Note: A sample completed Interconnection Request is included at the end of the presentation.**

# Submittal of WDAT QC14 Interconnection Requests

Send the completed IR and technical documents to SCE via one of the following\*:

**Email:**  
(Preferred)

For ease of administration SCE **prefers** receiving digital application documents in lieu of hard copies at [grid.interconnections@sce.com](mailto:grid.interconnections@sce.com)

**Snail Mail:**

Southern California Edison Company  
Director of Grid Contracts Origination & Operations  
P.O. Box 800  
Rosemead, CA 91770

**Overnight:**  
(Do not use for payments)

Southern California Edison Company  
**Attn: GICD - IP&C – PIV3 2nd Fl**  
3 Innovation Way  
Pomona, CA 91768  
909-274-1106

Failure to include the "Attn:" line may result in the package being returned

**\*Note: SCE encourages submission of Interconnection Requests digitally due to the current environment and employees teleworking. If you are not able to submit your request digitally, please let us know well in advance of the close of the window at [InterconnectionQA@sce.com](mailto:InterconnectionQA@sce.com).**

# Submitting Deposits

- Cluster Study Process Deposit
  - \$50,000 plus \$1,000 per MW of electrical output of the generating facility (or the increase in electrical output of the generating facility) rounded up to the nearest whole MW, up to a max of \$250,000, and
  - \$20,000 for projects that include a request for Firm Charging Distribution Service.
  - Projects with a combination of Firm Charging Distribution Service and As-Available Charging Distribution service require an additional \$20,000.
- Site Exclusivity Deposit (optional) - In lieu of providing proof of Site Exclusivity, a Site Exclusivity Deposit may be submitted:
  - \$100,000 for a Small Generating Facility ( $\leq 20$  MW) or
  - \$250,000 for a Large Generating Facility
- Please don't send checks with your application documents – [send a request for payment instructions](#).
  - The instructions will indicate how to send the payment to SCE's Accounts Receivable separately from the documents. [Click for online link to: Request for Payment Instructions](#)
  - Due to SCE's current teleworking environment, it is preferred to wire the money as there are limited persons physically working in the office to accept and track payment.
  - After submitting payment, send us an email providing wire confirmation or check tracking number to: [Grid.Interconnections@sce.com](mailto:Grid.Interconnections@sce.com)



# Interconnection Request (IR) Forms

## WDAT Distribution Interconnections

- WDAT IR form (Appendix 1 to GIP), Payment Instructions can be found on the SCE portal:
  - [www.SCE.com](http://www.SCE.com) > Your Business > Generating Your Own Power > Grid Interconnections > Wholesale Distribution Access Tariff (WDAT) > Initiating a Request for Interconnection Under The GIP > Appendix 1 – Interconnection Request for a Generating Facility
  - Online Link: [Appendix 1 to GIP](#) (Revised for QC 14 applications)

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## CAISO Transmission Interconnections

**(Note: SCE does not accept CAISO Interconnection Requests)**

- CAISO Interconnection Request details:
  - Online Link: [CAISO Interconnection Request details](#)

Uncertain as to which Tariff to apply to? Please review the list on Slide 17 for the CAISO controlled lines and buses. If additional information is needed, send the project's proposed Point of Interconnection information to [InterconnectionQA@sce.com](mailto:InterconnectionQA@sce.com)

# Required Technical Documents

- **Single Line Diagram**

- Generators (number of units, size, manufacturer, voltage)
- Transformers (kVA rating, winding configuration, impedance, kVA base)
- Switches/disconnects of the proposed interconnection
- Protection Devices and Circuit Breakers
- Meters

- **Plot Plan**

- Shows the buildings, utility runs, equipment layout, the position of roads, and other constructions of an existing or proposed project site at a defined scale
- [Sample SLDs & Plot Plans](#)

- **Site Drawing**

- Shows generator project location and gen tie (if applicable)
- Point of Interconnection with the SCE's Distribution System
- GPS coordinates of the Customer's protective device
- To be provided in (.kmz) file

- **Detailed technical data for equipment**

- Manufacturer specifications and diagrams on:
  - Transformers
  - Inverters
    - UL1741 & UL 1741 SA Certification
    - Short Circuit Duty Contribution Information
  - Power system controls

# Smart Inverter Requirements

- Pursuant to the CPUC resolutions E-4920, E-4898 and E-5000 new interconnection requests utilizing smart inverters will require the following:
  - UL1741 SA - Implementation effective September 9, 2017
  - Reactive Power Priority (RPP) – Effective July 25, 2018
  - Function 5 & 6 (Frequency/Watt & Volt/Watt) –Effective February 22, 2019
  - Function SA17 and SA18 (Disconnect and Reconnect Command & Limit Maximum Active Power) – Effective June 22, 2020
- It is the responsibility of the customer/developer to purchase equipment which meets all requirements adopted in Resolutions [E-4920](#), [E-4898](#) and [E-5000](#).
- The California Energy Commission (CEC) manages the [list of eligible inverter equipment](#). For more information, visit the CPUC dedicated [Rule 21 Smart Inverter Working Group](#) website or an email may be sent to [InterconnectionQA@sce.com](mailto:InterconnectionQA@sce.com)

# Smart Inverter Requirements

- IEEE Std.1547 is relevant only to distribution connected resources
  - Does not apply to resources connected to the transmission or subtransmission system
  - Numerous changes to the original 2003 standard
- While inverter manufacturers may need to meet the requirements of IEEE 1547, BES resources are still subject to NERC Reliability Standards
- Existing inverters have been historically designed with distribution requirements in mind
  - While appropriate for distribution resources, this can lead to momentary cessation on the BPS which is not the intent
  - Investigations such as those into the Blue Cut Fire suggest that one root cause may have been the misapplication of IEEE 1547
- Further information regarding IEEE Std.1547 and NERC Guidelines related to inverter based resources can be found at:
  - <https://standards.ieee.org/standard/1547-2018.html>
  - [https://www.nerc.com/comm/OC\\_Reliability\\_Guidelines\\_DL/Inverter-Based\\_Resource\\_Performance\\_Guideline.pdf](https://www.nerc.com/comm/OC_Reliability_Guidelines_DL/Inverter-Based_Resource_Performance_Guideline.pdf)

# Demonstrating Site Exclusivity

- Read and follow SCE's Guidelines for Demonstration of Site Exclusivity: [Site Exclusivity Guidelines](#)
- Reminders:
  - The Assessor's Parcel Number (APN) should be listed on both the Site Exclusivity Documentation and the IR form. Please include the project's GPS coordinates and acreage.
  - In lieu of providing proof of Site Exclusivity, a Site Exclusivity Deposit may be submitted:
    - \$100,000 for a Small Generating Facility ( $\leq 20$  MW) or
    - \$250,000 for a Large Generating Facility ( $> 20$  MW)
  - If site exclusivity documentation is not ready, SCE encourages the Site Exclusivity Deposit be submitted
    - SCE pays interest from date of receipt and there is no risk missing the cluster deadlines

# APN Needs to Appear on Both Documents

## Sample Site Exclusivity Document

Recording Requested by:  
Jane Doe

And when recorded, mail the instrument and tax statements to:  
Jane Doe  
123 Street  
Edisonville, CA

Deed/Lease/Option Document label

APN: 123-456-78910

For a valuable consideration, receipt of which is hereby acknowledged,  
Jane Doe, a single woman  
Hereby (grants/leases/provides option to lease or purchase) to: Jane Doe and John Doe  
As joint tenants  
The following real property in the City of Edisonville, County of Los Angeles, California:  
Lot 00 of XYZ Addition to the City of Edisonville, as delineated on the map of said addition, recorded  
01/01/2001, in Book 62, Page 013065

If Lease/Deed/Option, add terms here which should be through a specific DATE (which may include an  
expiration date) such as 3/15/2020

Name of Legal Entity: Jane and John Doe

Date \_\_\_\_\_ Signature: signature  
Date \_\_\_\_\_ Signature: signature

State of California  
County of \_\_\_\_\_  
On \_\_\_\_\_

## Interconnection Request Form

5. Interconnection Customer provides the following information:

a. Address or location, including the county, of the proposed new Generating Facility site (to the extent known) or, in the case of an existing Generating Facility, the name and specific location, including the county, of the existing Generating Facility:

Project Name: \_\_\_\_\_

Project Location: \_\_\_\_\_  
Street Address: \_\_\_\_\_  
City, State: \_\_\_\_\_  
County: \_\_\_\_\_  
Zip Code: \_\_\_\_\_  
GPS Coordinates: \_\_\_\_\_  
Assessor's Parcel Numbers (if available): \_\_\_\_\_

Please put the Assessor's Parcel Number (APN) on the Interconnection Request form, section 5.a. and include acreage.

# Lease/Option Date Must be Through COD

## Sample Site Exclusivity Document

Recording Requested by:  
Jane Doe

And when recorded, mail the instrument and tax statements to:  
Jane Doe  
123 Street  
Edisonville, CA

Deed/Lease/Option Document label

APN: 123-456-78910

For a valuable consideration, receipt of which is hereby acknowledged,  
Jane Doe, a single woman  
Hereby (grants/leases/provides option to lease or purchase) to: Jane Doe and John Doe  
As joint tenants  
**The following real property in the City of Edisonville, County of Los Angeles, California:**  
Lot 00 of XYZ Addition to the City of Edisonville, as delineated on the map of said addition, recorded  
01/01/2001, in Book 62, Page 013065

If Lease/Deed/Option, add terms here which should be through a specific DATE (which may include an expiration date) such as 3/15/2020

Name of Legal Entity: Jane and John Doe

Date \_\_\_\_\_ Signature: signature  
Date \_\_\_\_\_ Signature: signature

State of California  
County of \_\_\_\_\_  
On \_\_\_\_\_

## Interconnection Request Form

d. Proposed In-Service Date, and Other Key Dates (Day/Month/Year) (Dates must be sequential)

Proposed In-Service Date: / /  
Proposed Trial Operation Date: / /  
Proposed Commercial Operation Date: / /  
Proposed Term of Service (years):

The term of the site exclusivity document should be, at a minimum, through the Commercial Operation Date, application section 5.d.

## Interconnection Request Form

11. This Interconnection Request is submitted by:

Legal name of Interconnection Customer: \_\_\_\_\_  
By (signature): \_\_\_\_\_  
Name (type or print): \_\_\_\_\_  
Title: \_\_\_\_\_  
Date: \_\_\_\_\_

The legal name of the Interconnection Customer on the application section 11 should tie to the legal entity in the site exclusivity document

# Guidelines for Sizing Your Generating Facility

- During the Scoping Meeting, Distribution Engineering will provide system conditions and any known limitations that can assist customers to appropriately size their project.
- Allowable maximum Generation is subject to change based on queue generation and reliability constraints
- Sizes may differ based on adding energy storage due to Circuit/Substation loading



# Distribution Circuit Max Capabilities

Voltage Class	Typical Highest Planned Loading Limit - SCE Distribution (MW)
4 kV	~ 2.7
12 kV	~ 11.9
16 kV	~ 16
33 kV	~ 32

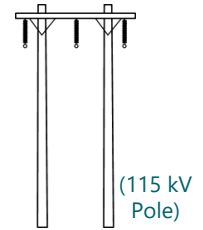
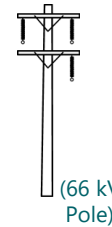
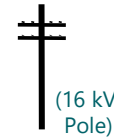
The above table provided shows typical **maximum** size limitations.

The values provided are for informational purposes. System constraints and limitations can vary depending on multiple factors e.g. queued generation, existing circuit configuration, existing equipment limitations.

# Grid Voltages – WDAT vs. TOT

SCE's distribution system = SCE controlled = WDAT

- 4 kV – 16 kV: **residential** circuits
- 16 kV – 33 kV: city/industrial circuits
- 55 kV – 115 kV: sub-transmission



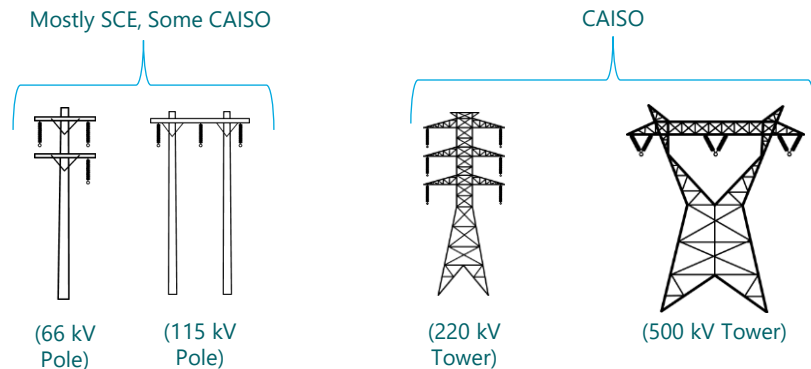
CAISO Controlled Line	kV
Control-Silver Peak "A"	55
Control-Silver Peak "C"	55
Antelope - Neenach	66
Bailey - Neenach	66
Control-Haiwee-Inyokern	115
Control-Coso-Haiwee-Inyokern	115
Inyokern-Kramer-Randsburg No.1	115
Inyokern-Kramer-Randsburg No.3	115
Ivanpah-Baker-Coolwater-Dunn Siding-Mountain Pass	115
Kramer-Roadway	115
Kramer-Victor	115
Roadway-Victor	115

CAISO Controlled Bus	kV
Control	55
Antelope	66
Bailey	66
Neenach	66
Coolwater	115
Control	115
Inyokern	115
Ivanpah	115
Kramer	115
Roadway	115
Tortilla	115
Victor	115

# Grid Voltages – WDAT vs. TOT

SCE's transmission system = CAISO & SCE controlled

- 220 kV & 500 kV jurisdiction fall under applicability of the CAISO Tariff
  - Interconnection Requests must be sent to the CAISO
- Majority of the 66 kV and 115 kV system is under SCE control
  - Some exceptions do apply
  - If Interconnection Request is to the CAISO controlled grid, the project must apply to the CAISO and **not** SCE



# CAISO/WDAT Deliverability Options

Deliverability: Defined as the annual Net Qualifying Capacity of a Generating Facility, as verified through a Deliverability Assessment and measured in MW, which specifies the amount of resource adequacy capacity the Generating Facility is eligible to provide.

You must select one:

- Energy Only Deliverability Status
  - Avoids cost of delivery network upgrades
  - Cannot qualify as a Resource Adequacy resource in PPA
- Full Capacity Deliverability Status
  - Allocated delivery network upgrades in interconnection studies
  - Can qualify as a Resource Adequacy resource in PPA
- Partial Capacity Deliverability Status
  - Allocated delivery network upgrades in interconnection studies
  - Can qualify as a Resource Adequacy resource in PPA

All options/selections/choices are subject to curtailment

# Charging Distribution Service for Storage projects

- An Interconnection Customer ("IC") can choose one of the following: 1) As-Available Charging Distribution Service only; 2) Firm Charging Distribution Service only; 3) a combination of As-Available Charging Distribution Service and Firm Charging Distribution Service; 4) "None" (if the storage component will not charge from the grid, i.e., from onsite generation).
- As-Available customers will pay a new Energy Charge Rate and a new monthly Customer Charge, unless exempted. (For further information, please see FERC Docket No. ER19-2505).
- As-Available Charging Distribution Service is based on availability on the existing Distribution System and is subject to curtailment before retail load, Wholesale Distribution Load, and Firm Charging Capacity.
- Firm Charging Distribution Service has the same curtailment priority as retail load and Wholesale Distribution Load, except during abnormal or emergency events.
- Firm Charging Distribution Service customers will pay "Higher-of-Facilities" costs or a Demand Charge Rate based on average embedded cost of distribution grid (only one, not both).
- A Firm Charging Distribution Service customer paying the Demand Charge Rate (i.e., not subject to funding Higher-of-Facilities) will up-front finance the costs of Distribution Upgrades and those costs will then be returned to the customer upon COD, over a five-year period with levelized quarterly payments plus interest.

# Quick Tips

- Review our FAQ → [Click for online link: FAQ Link](#)
- If a deficiency notice is received for the IR, please respond quickly, and only revise applicable sections as requested by SCE.
- Apply Early!
  - The sooner an application is submitted, the sooner a response can be provided with correction requests, if necessary.
- Deposit must be submitted with completed Interconnection Request (Appendix 1 to GIP) and all requested technical data to be considered a complete package.
- **FINAL SUBMITTAL DATE = Friday, April 30<sup>th</sup>, 2021!**
  - **Please Note: CAISO QC14 window closes April 15!**

# Important Dates/Milestones

*Due Dates	Milestones
Friday, April 30, 2021	Last day to submit QC14 applications. <b>PLEASE do not wait until the last day!</b>
Friday, May 28, 2021	Latest/last day for the IC to <u>submit</u> corrected info (20 BDs after close of cluster window) [See GIP Attachment I Sections 4.2.2.1 and 4.2.2.2]
Monday, June 7, 2021	SCE last day to review and determine deemed complete/deemed deficient (5 BD review)
By July 1, 2021	Hold Scoping Meetings (no later than 60 CDs after close of cluster window)
By July 31, 2021	Execute Cluster Study Process Agreement (no later than 30 CDs after Scoping Meeting)
July 2021	Start Phase I Study
January 2022**	Publish Phase I Study Report (170 Calendar Days after start of the Phase I Study)
February 2022**	Hold Phase I Results Meetings
May 2022	Start Phase II Study

\*Note: Dates shown above could shift based on coordination with CAISO efforts.

\*\*Note: Dates shown above will shift accordingly for storage projects that choose Firm Charging Distribution Service.

# Important Links

## Website

- [SCE's WDAT](#)
- [SCE's Energy Procurement](#)

## Forms

- [WDAT Interconnection Request \(Appendix 1, Attachment A, & request for payment instructions\)](#)
- [CAISO Interconnection Request Details](#)

## Guidelines / Examples / Questions

- [Site Exclusivity Guidelines](#)
- [Distribution Resources Plan External Portal \(DRPEP\)](#)
- For questions on Interconnection Issues: [InterconnectionQA@sce.com](mailto:InterconnectionQA@sce.com)
- Send completed Interconnection Requests to: [Grid.interconnections@sce.com](mailto:Grid.interconnections@sce.com)
- [CAISO Interconnection Requests \(Including Prohibited Project Names\)](#)



# Have additional Questions?



Please submit questions via email  
to:  
[InterconnectionQA@sce.com](mailto:InterconnectionQA@sce.com)

# Acronym List For Presentation

Energy for What's Ahead®



<b>APN</b>	Assessor's Parcel Number	<b>IA</b>	Interconnection Agreement
<b>BES</b>	Bulk Electric System	<b>IC</b>	Interconnection Customer
<b>BPS</b>	Bulk Power System	<b>IEEE</b>	Institute of Electrical and Electronics Engineers
<b>BESS</b>	Battery Energy Storage System	<b>IR</b>	Interconnection Request
<b>CAISO</b>	The California Independent System Operator Corporation	<b>MW</b>	Megawatt
<b>CEC</b>	California Energy Commission	<b>NERC</b>	The North American Electric Reliability Corporation
<b>COD</b>	Commercial Operation Date	<b>PPA</b>	Power Procurement Agreement
<b>CPUC</b>	California Public Utilities Commission	<b>QC13</b>	Queue Cluster 13
<b>DRPEP</b>	Distribution Resources Plan External Portal	<b>RPP</b>	Reactive Power Priority
<b>DSA</b>	Distribution Service Agreement	<b>SCE</b>	Southern California Edison
<b>FAQ</b>	Frequently Asked Questions	<b>SLD</b>	Single Line Diagram
<b>GIA</b>	Generator Interconnection Agreement	<b>TOT</b>	Transmission Owner Tariff
<b>GIP</b>	Generator Interconnection Procedures	<b>UL</b>	Underwriters Laboratories
<b>GPS</b>	Global Positioning System	<b>WDAT</b>	Wholesale Distribution Access Tariff

# Sample Completed Application

Energy for What's Ahead®



**APPENDIX 1 to GIP**

**WHOLESALE DISTRIBUTION ACCESS TARIFF  
INTERCONNECTION REQUEST FOR A  
GENERATING FACILITY**

Provide two copies of this completed form pursuant to Section 7 of this GIP Appendix 1 below.

1. The undersigned Interconnection Customer submits this request to interconnect its Generating Facility with Distribution Provider's Distribution System pursuant to the following process under Appendix I of the Tariff (check only one):

- Cluster Study Process **This is being filled out for the Cluster Process**  
 Independent Study Process  
 Fast Track Process  
 Annual As-Available Application Window per GIP 3.14.2.2.2  
 Other (specify) \_\_\_\_\_

2. This Interconnection Request is for (check only one):

- A proposed new Generating Facility. **Is this a new facility?**  
 An increase in the generating capacity, or increase in the Charging Capacity resulting from installation of new equipment, or a Material Modification of an existing Generating Facility. **or are you adding-on to an existing project?**  
 A change to Full Capacity Deliverability Status for a Generating Facility previously studied as Energy Only Deliverability Status in accordance with Section 4.7 of the GIP (Full Capacity Deliverability Study).  
 A new request for Charging Distribution Service for an existing or queued Generating Facility not resulting from installation of new equipment at the Generating Facility.\*

**No longer offered** →

\*Please complete only Sections 4, 5(c) and 10 of this Appendix 1, and Sections 2 and 11(C) of Attachment A to Appendix 1.

3. Deliverability Study is performed by the ISO. Requested Deliverability Status is for (check only one):

- Full Capacity Deliverability Status (this option applies to the Cluster Study Process and Independent Study Process only)  
 Partial Capacity Deliverability Status for  MW [specify requested MW to be evaluated for Deliverability. This MW amount should be less than the total MW of the Generating Facility) of electrical output (this option applies to the Cluster Study Process and Independent Study Process only)  
 Energy Only Deliverability Status (this option applies to the Cluster Study Process, Independent Study Process, and Fast Track Process)

**Select one deliverability option.**

\$20,000 additional deposit for Firm Charging and combination As-Available and Firm Charging projects.

4. Requested Charging Distribution Service for Generating Facilities with storage is for (choose only one option and list Contract Demand amount):

For storage projects, select one Charging Distribution Service option.

- As-Available Charging Distribution Service only: \_\_\_\_ MW
- Firm Charging Distribution Service only: \_\_\_\_ MW
- Combination of Firm Charging Distribution Service and As-Available Charging Distribution Service:
  - Firm Charging Distribution Service: \_\_\_\_ MW
  - As-Available Charging Distribution Service \_\_\_\_ MW
- None (Charging from onsite generation)

If the Interconnection Request is for Charging Distribution Service for an Existing or Queued Generating Facility per Section 2, include the requested commencement date(s) for the Firm Charging Distribution Service and/or As-Available Charging Distribution Service: \_\_\_\_\_.

5. Interconnection Customer provides the following information:

a. Address or location, including the county, of the proposed new Generating Facility site (to the extent known) or, in the case of an existing Generating Facility, the name and specific location, including the county, of the existing Generating Facility;

Project Name:

Project Location:

Street Address:

City, State:

County:

Zip Code:

GPS Coordinates:

Assessor's Parcel Numbers (if available):

b. Maximum net megawatt electrical output (as defined by section 2.C. of Attachment A to this appendix) of the proposed new Generating Facility or the amount of net megawatt increase in the generating capacity of an existing Generating Facility;

Maximum  megawatt electrical output (MW): \_\_\_\_\_

Megawatt increase (MW): \_\_\_\_\_

Must align with Attachment A, item 2c

or

c. Type of project (i.e., gas turbine, hydro, wind, etc.) and general description of the equipment configuration (if more than one type is chosen, include net MW for each);

___ Cogeneration	___ MW
___ Reciprocating Engine	___ MW
___ Biomass	___ MW
___ Steam Turbine	___ MW
___ Gas Turbine	___ MW
___ Wind	___ MW
___ Hydro	___ MW
___ Inverter Based: (e.g., Photovoltaic, Fuel Cell)	___ MW
If Fuel Cell, please describe primary fuel source:	___
___ Storage (rated discharging power)	___ MW
Storage type (e.g., Pump-Storage Hydro, Battery):	_____
_____	
___ Combined Cycle	___ MW
___ Other (please describe):	Check "Other" and include Inverter Based Storage here

d. Proposed In-Service Date, and Other Key Dates (Day/Month/Year) (Dates must be sequential)

Proposed In-Service Date:	/	/
Proposed Trial Operation Date:	/	/
Proposed Commercial Operation Date:	/	/
Proposed Term of Service (years):	_____	

← Site Exclusivity Documentation should be, at a minimum, through the COD

e. Name, address, telephone number, and e-mail address of Interconnection Customer's contact person (primary person who will be contacted);

List the Primary Person you would like us to call or email regarding your project

Name:  
 Title:  
 Company Name:  
 Street Address:  
 City, State:  
 Zip Code:  
 Phone Number:  
 Fax Number:  
 Email Address:  
 Interconnection Customer's DUNS Number:

f. Point of Interconnection:

DRPEP can be used to assist with completing this info.

Distribution Substation (Name and voltage level): \_\_\_\_\_, or  
 Distribution Feeder: \_\_\_\_\_, or  
 Approximate location of the proposed Point of Interconnection \_\_\_\_\_  
 \_\_\_\_\_ (i.e., specify distribution facility interconnection point name, voltage level, and the location of interconnection);

- g. Interconnection Customer Data (set forth in Attachment A)

***The Interconnection Customer shall provide to the Distribution Provider the technical data called for in Attachment A. Two (2) copies are required.***

**Only one copy needed if submitted electronically**

- h. Primary frequency response operating range for electric storage resources.
6. Applicable Interconnection Study Deposit amount as specified in GIP Section 4.2.1 or 4.7.1, as applicable, for the Cluster Study Process or GIP Section 5.2.1 for the Independent Study Process, or \$1,500 as provided in GIP Section 6.2 for the Fast Track Process made payable to Southern California Edison Company. Send check to Distribution Provider along with:
1. A completed Interconnection Request form for processing.
  2. A completed Attachment A (Interconnection Request Generating Facility Data).

7. Evidence of Site Exclusivity as specified in GIP Sections 4.2.1, 5.2.1, or 6.3, as applicable, and name(s), address(es) and contact information of site owner(s). (check one)

Select one and SCE will send payment instructions for Site Exclusivity Deposit

- Is attached to this Interconnection Request
- If Interconnection Customer requests processing under the Cluster Study Process or Independent Study Process, then deposit in lieu of Site Exclusivity attached. Site Exclusivity will be provided at a later date in accordance with this GIP.

8. This Interconnection Request shall be submitted to the Distribution Provider as indicated below:

Southern California Edison Company  
Grid Interconnection & Contract Development  
P.O. Box 800  
2244 Walnut Grove Avenue  
Rosemead, CA 91770

Email: [grid.interconnections@sce.com](mailto:grid.interconnections@sce.com)  
Phone: (626) 302-3688

**Strongly encourage Interconnection Request to be submitted via email**

9. Representative of Interconnection Customer to contact:

List someone we can call or email regarding your project.

[To be completed by Interconnection Customer]  
Name:  
Title:  
Company Name:  
Street Address:



City, State:  
Zip Code:  
Phone Number:  
Fax Number:  
Email Address:

10. **Interconnection Request now includes distribution service information (Section 10); a separate Distribution Service request is not required, nor a deposit, when an Interconnection Request is submitted**  
Distribution Service, pursuant to Section 15.1 of the Tariff. The following information is required in accordance with Section 15.2 of the Tariff:

For storage projects, a selection is required under the Charging Distribution Service section

- a. Distribution Service capacity requested:
- i. Generation: \_\_\_\_\_ MW (export quantity as measured at the Point of Interconnection)
  - ii. Charging Distribution Service (choose only one option and list Contract Demand amount):
    - 1. As-Available Charging Distribution Service only: \_\_\_\_ MW
    - 2. Firm Charging Distribution Service only: \_\_\_\_ MW
    - 3. Combination of Firm Charging Distribution Service and As-Available Charging Distribution Service:  
Firm Charging Distribution Service \_\_\_\_ MW  
As-Available Charging Distribution Service \_\_\_\_ MW
- b. Provide five (5) year forecast of monthly generation output requirements beginning with the first year after service is scheduled to commence.

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

The party requesting Distribution Service shall be, or will be upon commencement of service, an Eligible Customer as defined under Section 2 of the Tariff. An Eligible Customer with Charging Capacity shall have the necessary contractual arrangements or existing contracts in place to receive power from the ISO Grid prior to the commencement of Distribution Service.

11. This Interconnection Request is submitted by:

Legal name of Interconnection Customer: **This is the name you would like to be on the Agreements. It needs to match the site exclusivity documents.**

By (signature): **Signatory must be duly authorized to bind the customer to the terms of this request.** \_\_\_\_\_

Name (type or print): **Printed name of signer** \_\_\_\_\_

Title: **Title of Signer** \_\_\_\_\_

Date: **Date signed** \_\_\_\_\_

**WHOLESALE DISTRIBUTION ACCESS TARIFF  
GENERATING FACILITY DATA**

Provide two copies of this completed form pursuant to Section 7 of Interconnection Request.

Each Interconnection Customer will complete Sections 1 and 2 of this Attachment A.  
Each Interconnection Customer will complete the applicable data in Sections 3 through 6 of this Attachment A based on the type of generating facility(ies) requesting interconnection. (Section 3 for synchronous generators, Section 4 for induction generators, Section 5 for wind turbine generators, and Section 6 for inverter-based generators).

Each Interconnection Customer will complete Sections 7 through 10, as applicable.

At any time, Distribution Provider may require Interconnection Customer to provide additional technical data, or additional documentation supporting the technical data provided, as deemed necessary by the Distribution Provider to perform Interconnection Studies, other studies, or evaluations as set forth under the GIP.

Digital preferred, or  
okay to send 11x17

**1. Provide two original prints and one reproducible copy (no larger than 36" x 24") of the following:**

Include Google Earth KMZ file outlining entire project site

- A. Site drawing showing generator location and Point of Interconnection with the Distribution Provider's Distribution System.
- B. Single-line diagram showing applicable equipment such as generating units, step-up transformers, auxiliary transformers, switches/disconnects of the proposed interconnection, including the required protection devices and circuit breakers. This one-line drawing must be signed and stamped by a licensed Professional Engineer if the Generating Facility is larger than 50 kW.

**2. Generating Facility General Information:**

- A. Total Generating Facility rated output (MW): \_\_\_\_\_
- A1. Maximum Generating Facility operating capacity (MW): \_\_\_\_\_  
(applicable if the Generating Facility output will be limited to less than rated capacity)
- B. Generating Facility auxiliary load (MW): **Show MW and explain what it includes**
- C. Net Generating Facility capacity at generator/inverter terminals (MW):  
\_\_\_\_\_ (A-B) or (A1-B)
- D. Collector system losses (MW): \_\_\_\_\_ (insert "n/a" if not applicable or negligible)
- E. Main step-up transformer losses (MW): \_\_\_\_\_ (insert "n/a" if not applicable or negligible)
- F. Net Generating Facility capacity at high-side of main step-up transformer (MW):  
\_\_\_\_\_ (C-D-E)
- G. Gen-tie loss to Point of Interconnection (MW): \_\_\_\_\_ (insert "n/a" if

Lines B,J,K  
and N must  
align with  
your one-line  
diagram

- not applicable or negligible)
- H. Net Generating Facility capacity at Point of Interconnection (MW):  
\_\_\_\_\_ (F-G)
- H1. Maximum export capacity at Point of Interconnection (MW): \_\_\_\_\_  
(applicable if the requested export capacity at the Point of Interconnection is less than the Net Generating Facility capacity at the Point of Interconnection. If so, please indicate the reason (e.g., serving host load, etc.)) \_\_\_\_\_
- I. Standby Load when Generating Facility is off-line (MW): \_\_\_\_\_
- J. Number of Generating Units: \_\_\_\_\_  
(Please repeat the following items for each generator)
- K. Individual generator rated output (MW for each unit): \_\_\_\_\_
- L. Manufacturer of the Generating Units: \_\_\_\_\_
- M. Year Manufactured: \_\_\_\_\_
- N. Nominal Terminal Voltage (kV): Output voltage of inverters \_\_\_\_\_
- O. Rated Power Factor (%): \_\_\_\_\_
- P. Type (induction, synchronous, D.C. with inverter): \_\_\_\_\_
- Q. Phase (3 phase or single phase): \_\_\_\_\_
- R. Connection (Delta, Grounded WYE, Ungrounded WYE, impedance grounded):  
\_\_\_\_\_
- S. Generator Voltage Regulation Range (+/- %): \_\_\_\_\_
- T. Generator Power Factor Regulation Range: \_\_\_\_\_
- U. For combined cycle plants, specify the plant net output capacity (MW) for an outage of the steam turbine or an outage of a single combustion turbine \_\_\_\_\_

### 3. Synchronous Generator –Information:

#### 3A Generator Information:

(Please repeat the following for each generator)

- A. Rated Generator speed (rpm): \_\_\_\_\_
- B. Rated MVA: \_\_\_\_\_
- C. Rated Generator Power Factor: \_\_\_\_\_
- D. Generator Efficiency at Rated Load (%): \_\_\_\_\_
- E. Moment of Inertia (including prime mover): \_\_\_\_\_
- F. Inertia Time Constant (on machine base) H: \_\_\_\_\_ sec or MJ/MVA
- G. SCR (Short-Circuit Ratio - the ratio of the field current required for rated open-circuit voltage to the field current required for rated short-circuit current): \_\_\_\_\_
- H. Please attach generator reactive capability curves.
- I. Rated Hydrogen Cooling Pressure in psig (Steam Units only):  
\_\_\_\_\_
- J. Please attach a plot of generator terminal voltage versus field current that shows the air gap line, the open-circuit saturation curve, and the saturation curve at full load and rated power factor.

**3B Excitation System Information:**

(Please repeat the following for each generator)

- A. Indicate the Manufacturer \_\_\_\_\_ and Type \_\_\_\_\_ of excitation system used for the generator. For exciter type, please choose from 1 to 9 below or describe the specific excitation system.
- (1) Rotating DC commutator exciter with continuously acting regulator. The regulator power source is independent of the generator terminal voltage and current.
  - (2) Rotating DC commutator exciter with continuously acting regulator. The regulator power source is bus fed from the generator terminal voltage.
  - (3) Rotating DC commutator exciter with non-continuously acting regulator (i.e., regulator adjustments are made in discrete increments).
  - (4) Rotating AC Alternator Exciter with non-controlled (diode) rectifiers. The regulator power source is independent of the generator terminal voltage and current (not bus-fed).
  - (5) Rotating AC Alternator Exciter with controlled (thyristor) rectifiers. The regulator power source is fed from the exciter output voltage.
  - (6) Rotating AC Alternator Exciter with controlled (thyristor) rectifiers.
  - (7) Static Exciter with controlled (thyristor) rectifiers. The regulator power source is bus-fed from the generator terminal voltage.
  - (8) Static Exciter with controlled (thyristor) rectifiers. The regulator power source is bus-fed from a combination of generator terminal voltage and current (compound-source controlled rectifiers system).
  - (9) Other (specify): \_\_\_\_\_
- B. Attach a copy of the block diagram of the excitation system from its instruction manual. The diagram should show the input, output, and all feedback loops of the excitation system.
- C. Excitation system response ratio (ASA): \_\_\_\_\_
- D. Full load rated exciter output voltage: \_\_\_\_\_
- E. Maximum exciter output voltage (ceiling voltage): \_\_\_\_\_
- F. Other comments regarding the excitation system? \_\_\_\_\_
- 

**3C Power System Stabilizer (“PSS”) Information:**

(Please repeat the following for each generator model. All new generators are required to install PSS unless an exemption has been obtained from WECC. Such an exemption can be obtained for units that do not have suitable excitation systems.)

- A. Manufacturer: \_\_\_\_\_
- B. Is the PSS digital or analog? \_\_\_\_\_
- C. Note the input signal source for the PSS?  
\_\_\_\_\_ Bus frequency \_\_\_\_\_ Shaft speed \_\_\_\_\_  
Bus Voltage \_\_\_\_\_ Other (specify source) \_\_\_\_\_
- D. Please attach a copy of a block diagram of the PSS from the PSS Instruction Manual and the correspondence between dial settings and the time constants or PSS gain.
- E. Other comments regarding the PSS?  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

### 3D Turbine-Governor Information:

(Please repeat the following for each generator model.)

Please complete Part A for steam, gas or combined-cycle turbines, Part B for hydro turbines, and Part C for both.

- A. Steam, gas or combined-cycle turbines:
  - (1) List type of unit (Steam, Gas, or Combined-cycle): \_\_\_\_\_
  - (2) If steam or combined-cycle, does the turbine system have a reheat process (i.e., both high and low pressure turbines)? \_\_\_\_\_
  - (3) If steam with reheat process, or if combined-cycle, indicate in the space provided, the percent of full load power produced by each turbine:  
Low pressure turbine or gas turbine: \_\_\_\_\_ %  
High pressure turbine or steam turbine: \_\_\_\_\_ %
  - (4) For combined cycle plants, specify the plant net output capacity (MW) for an outage of the steam turbine or an outage of a single combustion turbine: \_\_\_\_\_
  
- B. Hydro turbines:
  - (1) Turbine efficiency at rated load: \_\_\_\_\_ %
  - (2) Length of penstock: \_\_\_\_\_ ft
  - (3) Average cross-sectional area of the penstock: \_\_\_\_\_ ft<sup>2</sup>
  - (4) Typical maximum head (vertical distance from the bottom of the penstock, at the gate, to the water level): \_\_\_\_\_ ft
  - (5) Is the water supply run-of-the-river or reservoir: \_\_\_\_\_
  - (6) Water flow rate at the typical maximum head: \_\_\_\_\_ ft<sup>3</sup>/sec
  - (7) Average energy rate: \_\_\_\_\_ kW-hrs/acre-ft
  - (8) Estimated yearly energy production: \_\_\_\_\_ kW-hrs

C. Complete this section for each machine, independent of the turbine type.

- (1) Turbine manufacturer: \_\_\_\_\_
- (2) Maximum turbine power output: \_\_\_\_\_ MW
- (3) Minimum turbine power output (while on line): \_\_\_\_\_ MW
- (4) Governor information:
  - (a) Droop setting (speed regulation): \_\_\_\_\_
  - (b) Is the governor mechanical-hydraulic or electro-hydraulic (Electro-hydraulic governors have an electronic speed sensor and transducer.)? \_\_\_\_\_
  - (c) Other comments regarding the turbine governor system?  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

**3E Short Circuit Duty Information:**

For each generator, provide the following reactances expressed in p.u. on the generator base: Please provide manufacturer's supporting data

- $X_d$  – Direct Axis Synchronous Reactance: \_\_\_\_\_ p.u.
- $X'_d$  – Direct Axis Transient Reactance: \_\_\_\_\_ p.u.
- $X''_d$  – Direct Axis Subtransient Reactance: \_\_\_\_\_ p.u.
- $X_2$  – Negative Sequence Reactance: \_\_\_\_\_ p.u.
- $X_0$  – Zero Sequence Reactance: \_\_\_\_\_ p.u.

Generator Grounding (select one for each model):

Required for  
synchronous  
generators

- A. \_\_\_\_\_ Solidly grounded
- B. \_\_\_\_\_ Grounded through an impedance  
 (Impedance value in p.u. on generator base. R: \_\_\_\_\_ p.u.  
 X: \_\_\_\_\_ p.u.)
- C. \_\_\_\_\_ Ungrounded

**4. Induction Generator Information:**

(Please repeat the following for each generator)

- A. Motoring Power (kW): \_\_\_\_\_
- B.  $I_2^2t$  or K (Heating Time Constant): \_\_\_\_\_
- C. Rotor Resistance,  $R_r$ : \_\_\_\_\_
- D. Stator Resistance,  $R_s$ : \_\_\_\_\_
- E. Stator Reactance,  $X_s$ : \_\_\_\_\_
- F. Rotor Reactance,  $X_r$ : \_\_\_\_\_
- G. Magnetizing Reactance,  $X_m$ : \_\_\_\_\_
- H. Short Circuit Reactance,  $X_d''$ : \_\_\_\_\_

- I. Exciting Current: \_\_\_\_\_
- J. Temperature Rise: \_\_\_\_\_
- K. Frame Size: \_\_\_\_\_
- L. Design Letter: \_\_\_\_\_
- M. Reactive Power Required In Vars (No Load): \_\_\_\_\_
- N. Reactive Power Required In Vars (Full Load): \_\_\_\_\_
- O. Total Rotating Inertia, H: \_\_\_\_\_ Per Unit on kVA Base

**5. Wind Turbine Generator (WTG) Information:**

(Proposed projects may include one or more WTG types. Please repeat the following for each type of WTG).

- A. Number of generators to be interconnected pursuant to this Interconnection Request: \_\_\_\_\_
- B. Average Site Elevation: \_\_\_\_\_ Single Phase \_\_\_\_\_ Three Phase \_\_\_\_\_
- C. Field Volts: \_\_\_\_\_
- D. Field Amperes: \_\_\_\_\_
- E. Motoring Power (MW): \_\_\_\_\_
- F. Neutral Grounding Resistor (If Applicable): \_\_\_\_\_
- G.  $I_2^2t$  or K (Heating Time Constant): \_\_\_\_\_
- H. Rotor Resistance: \_\_\_\_\_
- I. Stator Resistance: \_\_\_\_\_
- J. Stator Reactance: \_\_\_\_\_
- K. Rotor Reactance: \_\_\_\_\_
- L. Magnetizing Reactance: \_\_\_\_\_
- M. Short Circuit Reactance: \_\_\_\_\_
- N. Exciting Current: \_\_\_\_\_
- O. Temperature Rise: \_\_\_\_\_
- P. Frame Size: \_\_\_\_\_
- Q. Design Letter: \_\_\_\_\_
- R. Reactive Power Required In Vars (No Load): \_\_\_\_\_
- S. Reactive Power Required In Vars (Full Load): \_\_\_\_\_
- T. Total Rotating Inertia, H: \_\_\_\_\_ Per Unit on 100 MVA Base

Note: A completed General Electric Company Power Systems Load Flow (PSLF) data sheet must be supplied with the Interconnection Request. If other data sheets are more appropriate to the proposed device then they shall be provided and discussed at Scoping Meeting.

Distribution Provider may require testing verification of voltage and harmonic performance during commissioning test of WTG based generation projects.

**6. Inverter Based Generation Systems Information:**

(Proposed inverter based generation projects may include one or more types of inverters. Please repeat the following for each type of inverter).

- A. Inverter Manufacturer and Model: \_\_\_\_\_
- B. Number of Inverters: \_\_\_\_\_
- C. Nameplate Rating (AC, each inverter): \_\_\_\_\_ / \_\_\_\_\_ kW
- D. Nameplate Voltage Rating (AC): \_\_\_\_\_ kV
- E. Maximum AC line current: \_\_\_\_\_ Amps
- F. Nameplate Power Factor Rating (AC): \_\_\_\_\_
- G. Please attach capability curve describing reactive power or power factor range from no output to full rated output
- H. Inverter control mode (e.g. voltage, power factor, reactive power): \_\_\_\_\_
- I. Short Circuit Characteristics: Applicant to provide technical data related to the short circuit characteristics of proposed inverter based generation systems. For example, the applicant can provide a sinusoidal waveform test data showing faulted condition at the AC side of the inverter for a three phase and single-line-to-ground fault.
- J. Harmonics Characteristics:
  - (1) Inverter switching frequency: \_\_\_\_\_
  - (2) Harmonic characteristics for each unit up to switching frequency: \_\_\_\_\_
  - (3) Harmonic characteristics for aggregate generation facility: \_\_\_\_\_
- K. Inverter disconnection characteristics: Applicant to provide voltage sinusoidal waveform test data which shows the voltage characteristics during disconnection of inverter system from distribution system at 100% and at 50% of rated output.
- L. Provide documentation demonstrating compliance with the Smart Inverter requirements specified in Section 3.13 of the GIP.

Distribution Provider may require testing verification of voltage and harmonic performance during commissioning test of the inverter based generation systems.

**7. Step-Up Transformer Data:**

For each step-up transformer (e.g. main step-up transformers, padmount transformers), fill out the data form provided in Table 1.

**8. Interconnection Facilities Line Data:** Complete this section for 66kC and greater

For transmission lines that are to be planned by the generation developer, please provide the following information:

Nominal Voltage: \_\_\_\_\_ kV  
Line Length (miles): \_\_\_\_\_  
Line termination Points: \_\_\_\_\_



Conductor Type: \_\_\_\_\_ Size: \_\_\_\_\_  
If bundled. Number per phase: \_\_\_\_\_, Bundle spacing: \_\_\_\_\_ in.  
Phase Configuration. Vertical: \_\_\_\_\_, Horizontal: \_\_\_\_\_  
Phase Spacing (ft): A-B: \_\_\_\_\_, B-C: \_\_\_\_\_, C-A: \_\_\_\_\_  
Distance of lowest conductor to Ground at full load and 40°C: \_\_\_\_\_ ft  
Ground Wire Type: \_\_\_\_\_ Size: \_\_\_\_\_ Distance to Ground: \_\_\_\_\_ ft

Don't forget to provide this

→ Attach Tower Configuration Diagram

Summer line ratings in amperes (normal and emergency) \_\_\_\_\_  
Positive Sequence Resistance ( R ): \_\_\_\_\_ p.u.\*\* (for entire line length)  
Positive Sequence Reactance: ( X ): \_\_\_\_\_ p.u.\*\* (for entire line length)  
Zero Sequence Resistance ( R0 ): \_\_\_\_\_ p.u.\*\* (for entire line length)  
Zero Sequence Reactance: ( X0 ): \_\_\_\_\_ p.u.\*\* (for entire line length)  
Line Charging (B/2): \_\_\_\_\_ p.u.\*\*  
\*\* On 100-MVA and nominal line voltage (kV) Base

**9. For Wind/Photovoltaic Plants, provide Collector System Equivalence Impedance Data (if applicable):**

Provide values for each equivalence collector circuit at all voltage levels.

Nominal Voltage: \_\_\_\_\_ kV  
Summer line ratings in amperes (normal and emergency): \_\_\_\_\_  
Positive Sequence Resistance ( R ): \_\_\_\_\_ p.u.\*\* (for entire line length of each collector circuit)  
Positive Sequence Reactance: ( X ): \_\_\_\_\_ p.u.\*\* (for entire line length of each collector circuit)  
Zero Sequence Resistance ( R0 ): \_\_\_\_\_ p.u.\*\* (for entire line length of each collector circuit)  
Zero Sequence Reactance: ( X0 ): \_\_\_\_\_ p.u.\*\* (for entire line length of each collector circuit)  
Line Charging (B/2): \_\_\_\_\_ p.u.\*\*

\*\* On 100-MVA and nominal line voltage (kV) Base

**10. Plant-Level Reactive Power Compensation Data:**

Provide the following information for plant-level reactive power compensation, if applicable:

Ensure this aligns with one-line diagram

- A. Number of individual shunt capacitor banks: \_\_\_\_\_
- B. Individual shunt capacitor bank rated voltage (kV): \_\_\_\_\_
- C. Individual shunt capacitor bank size (kVAR at rated voltage): \_\_\_\_\_
- D. Planned dynamic reactive control devices (SVC, STATCOM): \_\_\_\_\_
- E. Control range: \_\_\_\_\_ kVAR (lead) \_\_\_\_\_ kVAR (lag)
- F. Control mode (e.g. voltage, power factor, reactive power): \_\_\_\_\_
- G. Please provide the overall plant reactive power control strategy

## 11. Storage System Information:

Interconnection Request now includes a new Section 11 in Attachment A, thus, "Additional Technical Data Form", or BESS Form is no longer required.

Description of the intended use of the storage system (e.g., export to the grid, peak shaving, load shifting, etc.): \_\_\_\_\_

Provide the following information for each type of storage device:

- A. Manufacturer and model: \_\_\_\_\_
- B. Source Functions
- (1) Total storage capability: \_\_\_\_\_ MWh
  - (2) Rated storage discharging power: \_\_\_\_\_ MW
  - (3) Maximum storage discharging power: \_\_\_\_\_ MW  
If the maximum storage discharging power is less than the rated storage discharging power, specify the device(s) used to limit the discharge (e.g., inverters, storage control, etc.): \_\_\_\_\_
  - (4) Discharge duration under rated power: \_\_\_\_\_ Hours
  - (5) Discharge duration under maximum power: \_\_\_\_\_ Hours
- C. Charging Functions
- (1) Rated storage charging power: \_\_\_\_\_ MW
  - (2) Maximum storage charging power: \_\_\_\_\_ MW  
If the maximum storage charging power is less than the rated storage charging power, specify the device(s) used to limit the charging (e.g., inverters, storage control, etc.): \_\_\_\_\_
  - (3) Charge duration under rated power: \_\_\_\_\_ Hours
  - (4) Charge duration under maximum power: \_\_\_\_\_ Hours
  - (5) Will the Distribution System be used to charge the storage device (Yes/No): \_\_\_\_\_  
If No, specify the device(s) used to prevent charging from the Distribution System (e.g., inverters, storage control, etc.): \_\_\_\_\_
- D. Primary frequency response operating range for electric storage resources (xx % of the upper charging limit of each storage component)
- (1) Minimum State of Charge: \_\_\_\_\_
  - (2) Maximum State of Charge: \_\_\_\_\_

## 12. Load Flow and Dynamic Models:

The WECC Data Preparation Manual for Power Flow Base Cases and Dynamic Stability Data has established power flow and dynamic modeling requirements for generation projects in WECC base cases. In general, if the aggregate sum of generation on a bus exceeds 10 MVA, it should not be netted. Furthermore, the total netted generation in an area should not exceed five percent of the area's total generation. Based on current WECC modeling requirements, the following information will be required for all generation projects whose net capacity is greater

than 10 MVA. The following information may also be required for generation projects less than 10 MVA on a case-by-case basis, based on the amount of generation in the area of the requested Point of Interconnection.

- A. Provide load flow model for the generating plant and its interconnection facilities in GE PSLF \*.epc format, including new buses, generators, transformers, interconnection facilities. An equivalent model is required for the plant with generation collector systems. This data should reflect the technical data provided in this Attachment A.

Ensure the epc file aligns with tech data provided in this Attachment

- B. For each generator, governor, exciter, power system stabilizer, WTG, or inverter based generator, select the appropriate dynamic models from the General Electric PSLF Program Manual and provide the required input data. Include any user written \*.p EPCL files to simulate inverter based plants' dynamic responses (typically needed for inverter based PV/wind plants). Provide a completed \*.dyd file that contains the information specified in this section.

All units must meet Frequency and LVRT requirements

The GE PSLF manual is available upon request from GE. There are links within the GE PSLF User's Manual to detailed descriptions of specific models, a definition of each parameter, a list of the output channels, explanatory notes, and a control system block diagram. In addition, GE PSLF modeling information and various modeling guidelines documents have been prepared by the WECC Modeling and Validation Work Group. This information is available on the WECC website ([www.wecc.biz](http://www.wecc.biz)).

If you require assistance in developing the models, we suggest you contact General Electric. Accurate models are important to obtain accurate study results. Costs associated with any changes in facility requirements that are due to differences between model data provided by the generation developer and the actual generator test data, may be the responsibility of the generation developer.

TABLE 1

TRANSFORMER DATA  
 (Provide for each level of transformation)

Provide all this data for three-winding transformers even if tertiary is buried or

Ensure this aligns with one-line diagram

UNIT\* \_\_\_\_\_

NUMBER OF TRANSFORMERS  PHASE \_\_\_\_\_

Ensure this info aligns with one-line diagram

RATING	H Winding	X Winding	Y Winding
Rated MVA	_____	_____	_____
Connection (Delta, Wye, Gnd.)	_____	_____	_____
Cooling Type (OA,OA/FA, etc) :	_____	_____	_____
Temperature Rise Rating	_____	_____	_____
Rated Voltage	_____	_____	_____
BIL	_____	_____	_____
Available Taps (% of rating)	_____	_____	_____
Load Tap Changer? (Y or N)	_____	_____	_____
Tap Settings	_____	_____	_____
IMPEDANCE	H-X	H-Y	X-Y
Percent	_____	_____	_____
MVA Base	_____	_____	_____
Tested Taps	_____	_____	_____
WINDING RESISTANCE	H	X	Y
Ohms	_____	_____	_____

Ensure this info aligns with one-line diagram

Provide Ohms or X over R ratio

CURRENT TRANSFORMER RATIOS

H \_\_\_\_\_ X \_\_\_\_\_ Y \_\_\_\_\_ N \_\_\_\_\_

PERCENT EXCITING CURRENT 100 % Voltage; \_\_\_\_\_ 110% Voltage \_\_\_\_\_

Supply copy of nameplate and manufacturer's test report when available.

\* For Generating Facilities with multiple step-up transformers, identify the transformer datasheet unit number with that of the single line.

Note: For 3 winding transformers, SCE needs data on all windings.  
 Note: Transformers illustrated on one-line diagram must match table shown above